



ICTS Seminar

Title : Radiative turbulence in magnetically dominated astrophysical plasmas

Speaker : Emanuele Sobacchi (Columbia University, New York, USA)

Date : Tuesday 14th June, 2022

Time : 04:00 pm (IST)

Abstract : Relativistic outflows in high-energy astrophysical sources are copious emitters of non-thermal radiation. These outflows are magnetically dominated (the magnetic energy per particle greatly exceeds the rest mass) and have huge Reynolds numbers. Turbulence is a natural candidate to dissipate the magnetic energy and accelerate a population of non-thermal particles that radiate via synchrotron and inverse Compton cooling.

The advent of large-scale Particle-In-Cell simulations makes it possible to study the turbulent energy cascade from first physical principles. I will show that particles are energised in large-scale current sheets where the magnetic field reconnects. Particles have a strong pitch angle anisotropy, i.e. their velocity is nearly aligned with the magnetic field. I will show that the anisotropy hardens the spectrum of the synchrotron radiation, and suppresses the synchrotron luminosity with respect to the inverse Compton luminosity. I will discuss the implications for the modelling of non-thermal radiation from astrophysical sources.

Venue : Please click on the below link to join the meeting

<https://icts-res-in.zoom.us/j/85733690318?pwd=L0V0TnNWM2o5SUo2KzRCTEg4YlppUT09>

Meeting ID: 857 3369 0318

Passcode: 141422